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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/657,875

09/09/2003

Chien-Ming Cheng

LELI 3495

2089

321

7590

06/23/2006

SENNIGER POWERS
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

IM, JUNGHWA M

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/657,875	CHENG ET AL.	
	Examiner	Art Unit	
	Junghwa M. Im	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/20/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a limitation of "... guide micro-deformation ... resulting in a rough contacting interface between said die 16 and solder platform 17 ..." It is unclear how the micro-deformation can be guided since micro-deformation means a defect in the device. Furthermore, the instant invention does not disclose that a rough surface is not formed by the anchor mechanism.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz et al. (US 6060776), hereinafter Spitz in view of Spitz et al. (US 6667545), hereinafter Spitz'545.

Regarding claim 1, insofar as understood, Fig. 1 of Spitz shows a diode (100) comprising a connecting means (8;a wire) and a heat sink base (a region below the wire 8);

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said connecting means comprising a flat end (7) fixed at a die (4) and the other end having no fixed shape;

said heat sink base comprising;

a base (2) which is on the bottom of the heat sink base;

a press-fit region (11) which is around said base (2);

a solder platform (3) which is above said base;

a die (4) which has a first side and a second side electrically coupled to said flat end (7) and said solder platform (3), respectively;

an acclivitous shoulder (15) which is extended from said solder platform, the root of said shoulder connected to said solder platform; and

a cup (9) which is extended upwardly from the periphery of said base (2);

characterized in that said solder platform has an anchor mechanism equipped with the said acclivitous shoulder and a kink, said mechanism can not only absorbed the stress generated by the package (13) but also guide micro-deformation and provide a longer path for moisture to reach the die, thereby avoiding damage of the die and resulting in a rough contacting interface between the die and the solder platform and preventing moisture from reaching the die directly even if moisture enters the gap existing between the shoulder and the passivation film (14).

Fig. 1 of Spitz shows substantially the entire claimed structure except the packaging is epoxy. Fig. 1 of Spitz-645 shows an epoxy packaging (40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Spitz'545 to the device of Spitz in order to have the package formed with epoxy since epoxy is well known and readily available packaging material.

Note that a functional recitation of “the combination of said acclivitous shoulder and the kink can absorbed the stress generated by the package and provide a longer path for moisture to reach the die, thereby preventing moisture from reaching the die directly even if moisture enters the gap existing between the shoulder and the passivation film” would not have carried patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a “means” for performing the specified function, as set forth in 35 USC §112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. *In re Fuller*, 1929 C.D. 172; 388 O.G. 279.

In addition, Spitz discloses that the combination of the acclivitous shoulder and the kink can absorb the stress generated by the package (col. 2, lines 58-62).

Regarding claim 2, Fig. 6 of Spitz-645 shows said shoulder has a height which is substantially the same as said die.

Also, note that Figures 3-5 of Spitz’535 show of a shoulder with a various height and an angle. Therefore, a variation in the height of the shoulder would have been obvious matter of an optimized design configuration since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 3, Spitz discloses said connecting means is a lead wire (col. 3, line 22).

Regarding claim 4, Fig. 1 of Spitz shows the diode further comprises two solder layers (5a) and (5b) which sandwich said die (4) above and under, respectively.

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Regarding claim 5, Fig. 1 of Spitz shows the diode further comprises passivative material (14) used to surround said wafer (4).

Regarding claim 6, Spitz'545 discloses the diode further comprises a resin (44; col. 3, line 11) for surrounding outside said passivative material (38).

Regarding claim 7, Fig. 1 of Spitz shows the diode further comprises a sheath (12) for surrounding the encapsulating material (13) inside said cup.

Regarding claim 8, Fig. 1 of Spitz shows further comprises a sheath (12) for surrounding the encapsulating material (13) outside said cup (9).

Response to Arguments

Applicant's arguments filed July 11, 2005 have been fully considered but they are not persuasive.

Applicant mainly argues that the instant invention has advantages that are not taught in the Spitz and the Spitz'545 references. However, it is pointed out that the instant invention is directed to the device claims and the combined teachings of Spitz and Spitz'545 show all the elements of the structure recited in the instant invention, in particular, a kink. Fig. 2 of Spitz shows that the acclivitous shoulder is not protruding from the top surface of the base 3. Rather the shoulder is extended through forming a kink from the top of the base. Furthermore, Spitz'545 also shows a kink formation on the top surface of the base.

In addition, it is confusing that Applicants argue that “ the present invention would not result in the rough contacting interface ...” However, the instant invention recites “... resulting in a rough contacting interface

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

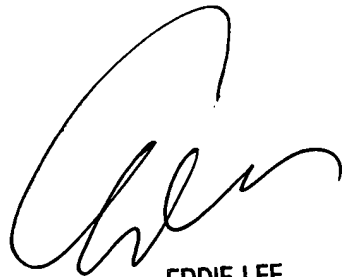
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (571) 272-1655. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmi

A handwritten signature in black ink, appearing to read 'Eddie Lee', with a large, sweeping initial 'E'.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800